

REMARKS

The Official Action dated December 15, 2004 has been received and its contents carefully noted. In view thereof, the specification as well as claims 1-16 have been amended in order to better define that which Applicant regards as the invention. As previously, claims 1-16 are presently pending in the instant application.

With reference now to the Official Action and particularly paragraph 1 thereof, the Disclosure has been objected to as including minor informalities. As can be seen from the foregoing amendments, those informalities noted by the Examiner have been cured. Furthermore, the specification has been amended at page 11 in order to more clearly define Applicant's claimed invention. Accordingly, it is respectfully submitted that Applicant's specification is now in proper formal condition for allowance. No new matter having been added.

With reference to paragraph 2 of the Office Action, claims 1-16 have been objected to as including minor informalities. As can be seen from the foregoing amendments, each of these claims have been amended in order to overcome the informalities noted by the Examiner. Accordingly, it is respectfully submitted that claims 1-16 are now in proper formal condition for allowance.

As to paragraph 4 of the Office Action, claims 1-16 have been rejected under 35 U.S.C. §112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Again, as can be seen from the foregoing amendments, each of claims 1-16 have been amended in order to overcome the instances of indefiniteness noted by the Examiner. Accordingly, it is respectfully submitted that Applicant's claimed invention as set forth in claims 1-16 is now in proper formal condition for allowance.

With reference now to paragraph 11 of the Office Action, Applicant wishes to acknowledge the Examiner's indication that claims 1-8 would be allowable if rewritten or amended to overcome the rejections under 35 U.S.C. §112, second paragraph set forth in the Office Action. In this regard, with the foregoing amendments it is respectfully requested that the submitted that claims 1-8 are now in proper formal condition for allowance.

With respect to the remaining claims, it is noted from paragraph 6 of the Office Action that claims 9 and 12 have been rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,473,957 issued to Voelkner et al. This rejection is respectfully traversed in that the patent to Voelkner et al. neither discloses nor suggests that which is presently set forth by Applicant's claimed invention.

As can be seen from the foregoing amendments, independent claim 9 has been amended to recite a junction device comprising a junction tool for joining a workpiece made of a plurality of plate materials superimposed in their thickness directions at points, comprising first and second tools that are placed on a junction axis substantially perpendicular to superimposed surfaces of the workpiece so as to nip the workpiece, one or both of the first and second tools being disposed so as to rotate about the junction axis, and a junction tool driving means wherein the first tool is provided with a pin protruding from its distal end surface along the junction axis and the second tool is provided with a recess which is depressed at its distal end surface along the junction axis such that the junction tool driving means nips the work piece with the junction tool in the direction of the junction axis and presses the same while rotating one or both of the first and second tools about the junction axis so as to sink the distal end portion of the junction tool into the workpiece, caulking in the direction of the junction axis, the superimposed surfaces of the workpiece softened by the friction heat generated between the pin of the first tool and the depression of the second tool

by rotation of the junction tool, generating plastic flow within the workpiece by the rotation of the junction tool so as to agitate the vicinity of the superimposed surfaces of the workpiece and pulling the junction tool from the workpiece. Clearly, the patent to Voelkner et al. neither discloses nor suggest that which is presently set forth by Applicants claimed invention.

Specifically, Voelkner et al. discloses a junction tool for connecting the workpiece by a clinching process. Thus, the junction tool of Voelkner is not a junction tool for connecting workpieces by the friction agitation junction method as is a case with the junction tool of Applicants claimed invention. Specifically, it is noted that the device for connecting overlapping flat parts set forth by Voelkner et al. uses a mold stamp with the overlapping flat parts being connected by movement of the mold stamp which is impressed with a tumbling motion throughout the entire joining process. Clearly, this reference fails to disclose or remotely suggest a junction device including a junction tool which carries out a friction agitation junction between the superimposed surfaces of the workpiece. Therefore, it is respectfully submitted that Applicants claimed as set forth in independent claim 9 as well as those claims which depend therefrom clearly distinguish over the teachings of Voelkner et al. and is in proper condition for allowance.

With reference to paragraph 8 of the Office Action, claim 10 has been rejected under 35 U.S.C. 103(a) as being unpatentable over Voelkner et al. in view of U.S. Patent No. 6,053,391 issued to Heideman et al. This rejection is likewise respectfully traversed in that the patent to Heideman et al. does nothing to overcome the aforementioned shortcomings associated with the teachings of Voelkner et al.

Particularly, while the patent to Heideman et al. discloses a junction tool for connecting the workpiece by way of a friction agitation junction method, this reference

clearly fails to disclose the method set forth in accordance with Applicants claimed invention. Particularly, it is noted that the junction tool of Heideman et al. includes only a first tool and fails to disclose both a first and a second tool as recited by Applicants claimed invention. Accordingly, it is respectfully submitted that Applicants claimed invention as set forth in dependent claim 10 clearly distinguishes over the combination proposed by the Examiner.

With reference to paragraph 9 of the Office Action, claim 11 has been rejected under 35 U.S.C. 103(a) as being unpatentable over Voelkner et al. in view of U.S. Patent No. 5,408,735 issued to Schleicher. This rejection is respectfully traversed in that the patent to Schleicher fails to overcome the aforementioned shortcomings associated with Voelkner et al. Moreover, it is respectfully submitted that claim 11 is directly dependent upon independent claim 9 and includes all the limitations thereof and is thus in proper condition for allowance for the reasons discussed and detailed hereinabove.

Furthermore, it is noted that Schleicher discloses a junction tool for connecting a workpiece by a clinching process. Clearly, the junction tool in Schleicher is not a junction tool for connecting the workpiece by the friction agitation junction method. Consequently, Schleicher when combined with the teachings of Voelkner continues to fail to disclose the junction device set forth in accordance with Applicants claimed invention. Accordingly, it is respectfully submitted that Applicants claimed invention as further defined by dependent claim 11 clearly distinguishes over the combination proposed by the Examiner and is proper condition for allowance.

With respect to paragraph 10 of the Office Action, claims 14 and 15 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Voelkner et al. view of Heideman et al. and Schleicher. This rejection is respectfully traversed in that the combination proposed by the Examiner neither discloses nor suggest that which is presently set forth by Applicants

claimed invention.

Again, as can be seen from the foregoing amendments, claim 14 has been amended to recite a junction device that includes limitations which are clearly not present in the combination as proposed by the Examiner. Particularly, independent claim 14, as amended, recites a junction device including a junction tool having first and second tools as well as a junction tool driving means with the first tool being provided with a pin protruding from its distal end surface along the junction axis and an annular concave groove at a distal end surface of the tool and a second tool provided with a depression which is depressed at its distal end along the junction axis and an annular convex portion at the distal end thereof such that the junction tool driving means nips the workpiece with the junction tool in the direction of the junction axis and presses the same while rotating at least one of the first and second tools about the junction axis so as to sink the distal end portion of the junction tool into the workpiece, caulking in the direction of the junction axis the superimposed surfaces of workpiece softened by friction heat generated between the pin and a concave groove of the first tool and the depression and the convex portion of the second tool by the rotation of the junction tool, generating plastic flow with a workpiece by the rotation of the junction tool so as to agitate the vicinity of the superimposed surfaces of the workpiece and pulling the junction tool away from the workpiece. Clearly, as discussed in detail hereinabove the combination proposed by the Examiner fails to disclose or suggest such features. Accordingly, it is respectfully submitted that independent claim 14 as well as claim 15 which depends therefrom are in proper condition for allowance.

It is further noted that dependent claims 13 and 16 have been rejected by the Examiner only on a formal grounds. Accordingly, with the foregoing amendments is respectfully submitted that these claims which depend from either independent claim 9 or

independent claim 14 likewise distinguish over the prior art of record and are in proper condition for allowance.

Therefore, in view of the foregoing, it is respectfully requested that the objections and rejections of record be reconsidered and withdrawn by the Examiner, that claims 1-16 be allowed and that the application be passed to issue.

Should the Examiner believe a conference would be of benefit in expediting the prosecution of the instant application, is hereby invited to telephone counsel to arrange such a conference.

Respectfully submitted,



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